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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/645,024 | 08/21/2003 | James Allan Kahle | AUS920030139US1 | 7352 |

7590 02/20/2008

Gregory W. Carr
670 Founders Square
900 Jackson Street
Dallas, TX 75202

| EXAMINER | |
|---|---|
| BUTLER, DENNIS | |
| ART UNIT | PAPER NUMBER |
| 2115 | |
| MAIL DATE | DELIVERY MODE |
| 02/20/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/645,024 | KAHLE ET AL. | |
| | Examiner | Art Unit | |
| | Dennis M. Butler | 2115 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *11 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *16-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. This action is in response to the amendment filed on September 11, 2007 and the RCE filed on November 19, 2007. Claims 16-36 are pending.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 16-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takashima et al., U. S. Patent Application Publication 2003/0135779 in view of Ebrahim, U. S. Patent 5,878,264.

Per claims 16 and 33:

A) Takashima et al teach the following claimed items:

1. a control register with the register comprising the bus width mode area 148 and the operation mode area 149 of figure 1 and/or the specific register and at paragraphs 65 and 167;

2. determining an idle (unused) status of a subunit (partial calculation units 132 a-c) of the processor based on the control register with bus width mode area 148 and bus width controlling unit 170 of figure 1, with partial calculation units 132 a-c of figure 2 and at paragraphs 13, 65-69 and 76-78;

3. providing a clock signal to the subunit based on the determined idle (unused) status with figures 2 and 3 and at paragraph 69;

4. providing a voltage to the subunit based on the determined idle (unused) status with figure 1 and at paragraph 68.

B) The claims differ from Takashima et al in that Takashima et al fails to explicitly teach providing a voltage to the subunit based on a power management signal as claimed.

C) Takashima describes providing a voltage to the subunit based on the determined idle (unused) status with figure 1 and at paragraph 68 but does not disclose also providing voltage to the subunit based on a power management signal as claimed. Ebrahim teaches that it is known to provide a power management signal to a processor that controls the voltage provided to the subunits of the processor with figure 4, at column 5, lines 50-55 and at column 6, lines 35-67. It would have been obvious for one having ordinary skill in the art at

the time the invention was made to provide a power management signal to a processor that controls the voltage provided to the subunits of the processor, as taught by Ebrahim, in order to provide a high level power management that places the subunits of the processor into a normal power state or a low power state while also providing the low level bus width mode power management disclosed by Takashima that places individual subunits into a normal power state or a low power state based on the idle status (used/unused) of the subunits. Ebrahim discloses that the techniques used to power down components are well known (column 6, lines 53-59). It would have been obvious for one of ordinary skill in the art to combine Takashima and Ebrahim because they are both directed to the problem of reducing electric power consumption of processors and adding Ebrahim's high level power control system to Takashima's power control system would allow for further power reduction by placing the processor in a low power state when it is not being actively used.

Per claims 17-23 and 34-36:

Takashima describes including a bus width mode area 148 and an operation mode area 149 in the control register and also describes including a specific register with the same areas at paragraphs 65 and 167. These areas comprise architected bits that indicate the bus width mode in the bus width mode area and architected bits that indicate the operation mode in the operation mode area. Therefore, the register corresponds to the claimed machine state register. Takashima describes that the bus width mode area/bits indicate whether the

calculation unit operates in an 8-bit, 12-bit or 16-bit mode in paragraph 66. Takashima describes that the 8-bit, 12-bit or 16-bit bus width modes determine which of the subunits 132 a-c of the calculation unit are active or powered at paragraphs 71 and 76-78. Therefore, at least one bit in the bus width mode area is associated with at least one subunit (partial calculation unit). Takashima describes reading at least one bit associated with at least one subunit with figure 1 and at paragraph 71. Takashima describes setting one or more bits based on an idle (unused) status of a subunit with figure 1 and at paragraphs 60-61 and 66-67. Takashima describes data flow circuitry comprising a plurality of sections with at least one section configured as a subunit with partial calculation units 132 a-c of figure 2 and at paragraphs 76-78. Takashima describes partitioned upper (15:12) and lower (7:0) bit data register circuitry portions configured as a subunit with the registers storing the scrA and scrB data bits (15:0) of figure 2, with figure 8 and at paragraphs 76-78 and 146-148. Takashima describes a partitioned ALU comprising an upper ALU (partial calculation unit 132c) and a lower ALU (partial calculation unit 132a) configured as subunits with instruction execution unit 130 of figure 1 and at paragraphs 63 and 64.

Per claims 25 and 33:

A) Takashima et al teach the following claimed items:

1. a software accessible control register having predetermined bit positions indicating subunits (partial calculation units 132 a-c) of the processor with the register comprising the bus width mode area 148 and the operation mode area

149 of figure 1 and/or the specific register, with figure 2 and at paragraphs 65-67, 76-78 and 167;

2. a local clock buffer coupled to the control register to provide a clock to the subunit based on the predetermined bit position associated with the subunit with frequency control unit 160 of figure 1 and clock gating unit 136 of figure 2 and at paragraphs 69 and 82;

3. a voltage signal coupled to the control register to provide a voltage to the subunit based on the predetermined bit position associated with the subunit at paragraph 68.

Regarding the predetermined bit positions indicating subunits, Takashima describes including a bus width mode area 148 and an operation mode area 149 in the control register and also describes including a specific register with the same areas at paragraphs 65 and 167. These areas comprise predetermined bit positions that indicate the bus width mode in the bus width mode area and predetermined bit positions that indicate the operation mode in the operation mode area. Takashima describes that the bus width mode area/bit positions indicate whether the calculation unit operates in an 8-bit, 12-bit or 16-bit mode in paragraph 66. Takashima describes that the 8-bit, 12-bit or 16-bit bus width mode bit positions determine which of the subunits 132 a-c of the calculation unit are active or powered at paragraphs 71 and 76-78. Therefore, the predetermined bit positions in the bus width mode area indicate subunits (partial calculation units).

B) The claims differ from Takashima et al in that Takashima et al fails to explicitly teach providing a clock signal to the subunit based on a power management signal as claimed.

C) Takashima describes providing a clock signal to the subunit based on the predetermined bit position with frequency control unit 160 of figure 1 and clock gating unit 136 of figure 2 and at paragraphs 69 and 82 but does not disclose also providing the clock signal to the subunit based on a power management signal as claimed. Ebrahim teaches that it is known to provide a power management signal to a processor that controls the clock signal provided to the subunits of the processor with figure 4, at column 5, lines 50-55 and at column 6, lines 35-67. It would have been obvious for one having ordinary skill in the art at the time the invention was made to provide a power management signal to a processor that controls the clock signal provided to the subunits of the processor, as taught by Ebrahim, in order to provide a high level power management that places the subunits of the processor into a normal power state or a low power state while also providing the low level bus width mode power management disclosed by Takashima that places individual subunits into a normal power state or a low power state based on the idle status (used/unused) of the subunits. Ebrahim discloses that the techniques used to power down components are well known (column 6, lines 53-59). It would have been obvious for one of ordinary skill in the art to combine Takashima and Ebrahim because they are both directed to the problem of reducing electric power consumption of processors

and adding Ebrahim's high level power control system to Takashima's power control system would allow for further power reduction by placing the processor in a low power state when it is not being actively used.

Per claims 26-31:

Takashima describes including a bus width mode area 148 and an operation mode area 149 in the control register and also describes including a specific register with the same areas at paragraphs 65 and 167. These areas comprise architected bits that indicate the bus width mode in the bus width mode area and architected bits that indicate the operation mode in the operation mode area. Therefore, the register corresponds to the claimed machine state register. Takashima describes that the bus width mode area/bits indicate whether the calculation unit operates in an 8-bit, 12-bit or 16-bit mode in paragraph 66. Takashima describes that the 8-bit, 12-bit or 16-bit bus width modes determine which of the subunits 132 a-c of the calculation unit are active or powered at paragraphs 71 and 76-78. Therefore, at least one bit in the bus width mode area is associated with at least one subunit (partial calculation unit). Takashima describes reading at least one bit associated with at least one subunit with figure 1 and at paragraph 71. Takashima describes setting one or more bits based on an idle (unused) status of a subunit with figure 1 and at paragraphs 60-61 and 66-67. Takashima describes data flow circuitry comprising a plurality of sections with at least one section configured as a subunit with partial calculation units 132 a-c of figure 2 and at paragraphs 76-78. Takashima describes partitioned upper

(15:12) and lower (7:0) bit data register circuitry portions configured as a subunit with the registers storing the scrA and scrB data bits (15:0) of figure 2, with figure 8 and at paragraphs 76-78 and 146-148. Takashima describes a partitioned ALU comprising an upper ALU (partial calculation unit 132c) and a lower ALU (partial calculation unit 132a) configured as subunits with instruction execution unit 130 of figure 1 and at paragraphs 63 and 64.

Per claims 24 and 32:

Takashima teaches the elements of claims 16 and 25 as described in the above rejection. The claims differ from Takashima in that Takashima fails to explicitly teach the processor comprising a floating point unit (FPU) configured as a subunit as claimed However, Takashima describes that the processor comprises calculation circuits such as arithmetic circuits including adding and multiplying circuits and logic circuits with instruction execution unit 130 of figure 1 and at paragraphs 63 and 64. FPUs are a well known component of processor and it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a FPU as a subunit of the processor, in view of Takashima's teaching of including a multiplying circuit, in order to perform floating point operations.

5. Applicant's arguments filed on September 11, 2007 have been fully considered but are moot in view of the new grounds of rejection.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis M. Butler whose telephone number is 571-272-

3663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Dennis M. Butler/

Primary Examiner, Art Unit 2115

Dennis M. Butler
Primary Examiner
Art Unit 2115